

Economic & Energy Impacts from Maryland's Participation in the Regional Greenhouse Gas Initiative

Allowance Auction & Energy Efficiency

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RGGI Allowances Allocation

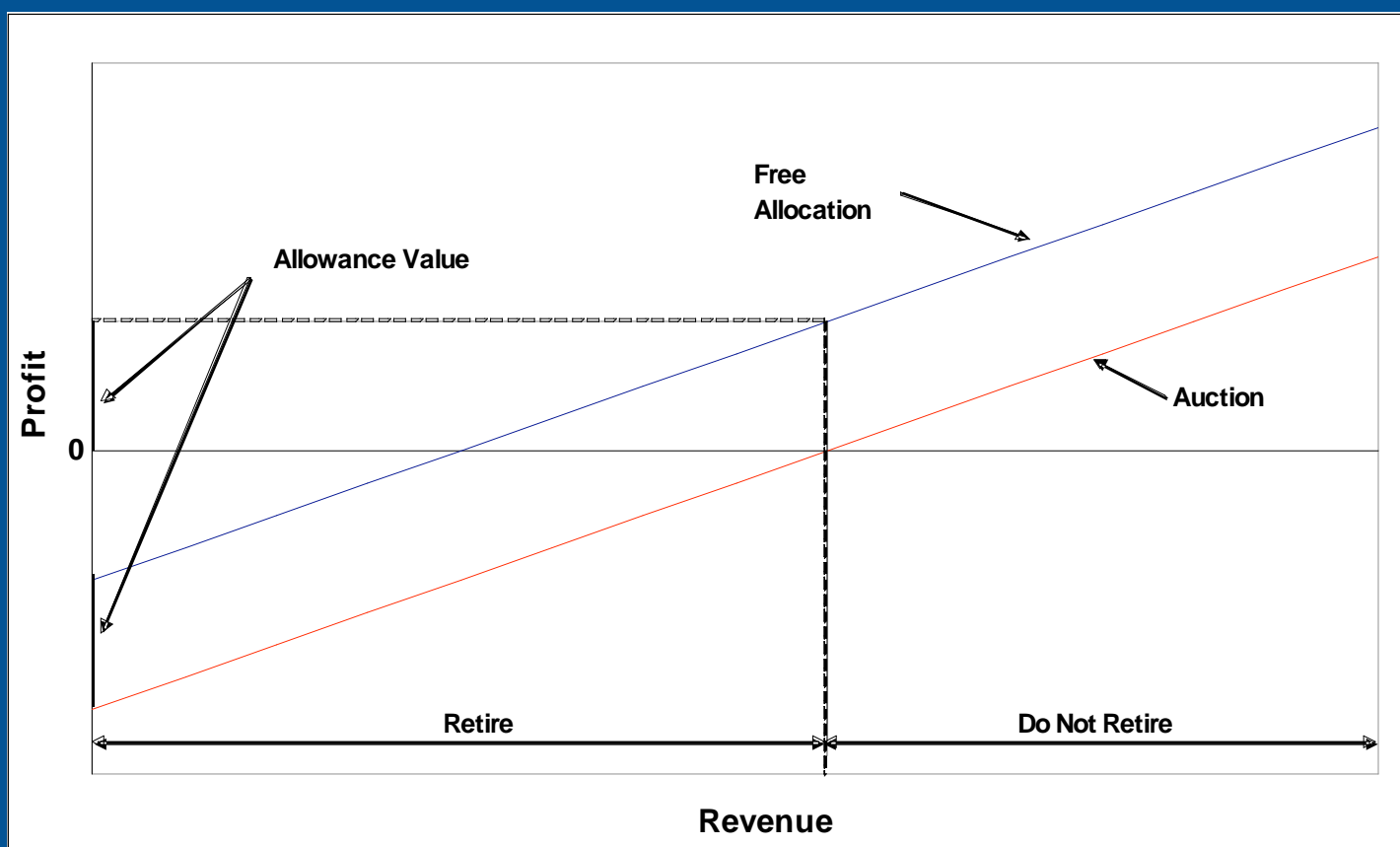
- 25% Auction, 75% Auction or Free
- Free allocation on the Title IV SO₂ model
 - Based on historical output
 - Allocation is retained through retirement
 - Dirty/inefficient generators can retire
 - Incentive structure for retirement identical to auction

Auction vs. Free Allocation in Competitive Electricity Markets (MD)

- Identical market effects
 - electricity prices
because of opportunity cost pass-through
 - retirement of generation capacity
because of allocation retention in retirement
- Asset transfer
 - Auction: state revenue
 - Free allocation: allowance value to generators

Auction vs. Free Allocation

Identical Retirement Incentives



Free Allocation vs. Allowance Auction & State Revenue

- Market effects identical
- Auction creates state revenue
- Energy efficiency initiatives move the market

Haiku

An Electricity Market Simulation Model

- lower 48 states divided into 20 regions
- flexibility
 - electricity markets
 - environmental policy
- major components
 - electricity prices & demand
 - generation capacity: investment, retirement, dispatch
 - inter-regional power trading
 - pollution abatement investment & emissions
 - fuel markets
 - demand efficiency supply curves (ACEEE, IPM)

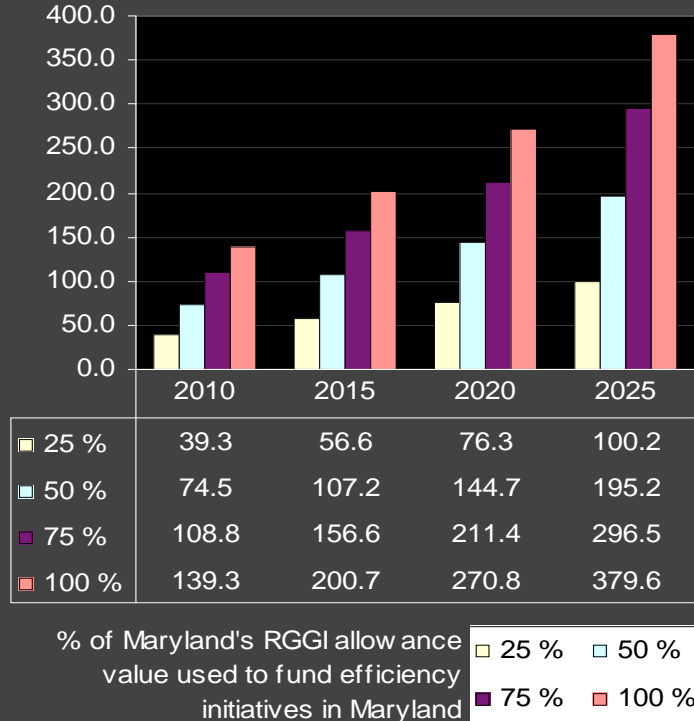
Scenarios

- Maryland Healthy Air Act in effect
- All other RGGI states auction 25% of allowances (except VT auctions 100%)

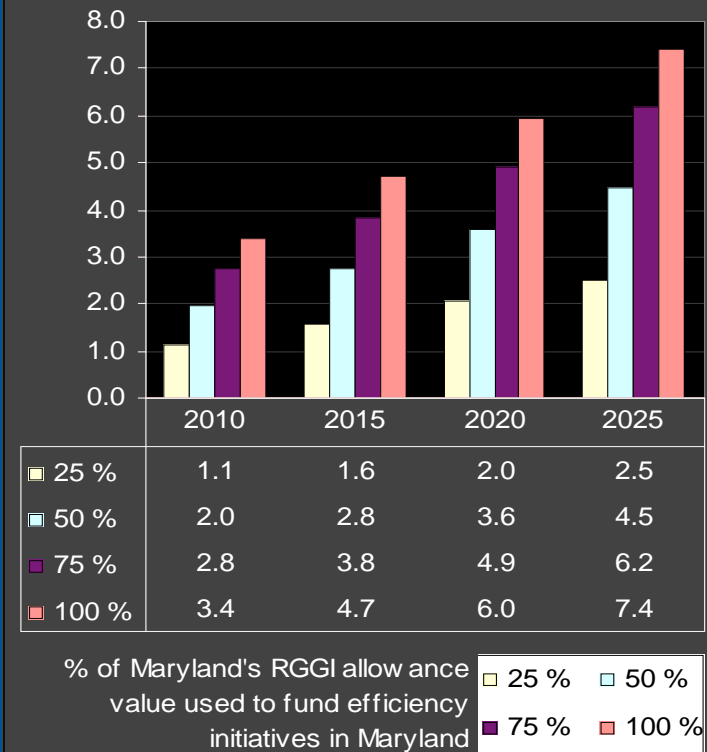
Title	Description		
Baseline	MD is NOT a participant in RGGI.		
25 %	MD participates in RGGI and auctions...	25%	...of its RGGI allowances. Auction revenues fund energy efficiency initiatives in Maryland.
50 %		50%	
75 %		75%	
100 %		100%	

Allowance Auction Revenue Energy Efficiency Initiatives

**Spending On Efficiency Initiatives
(Million \$)**



Efficiency Savings [BkWh]

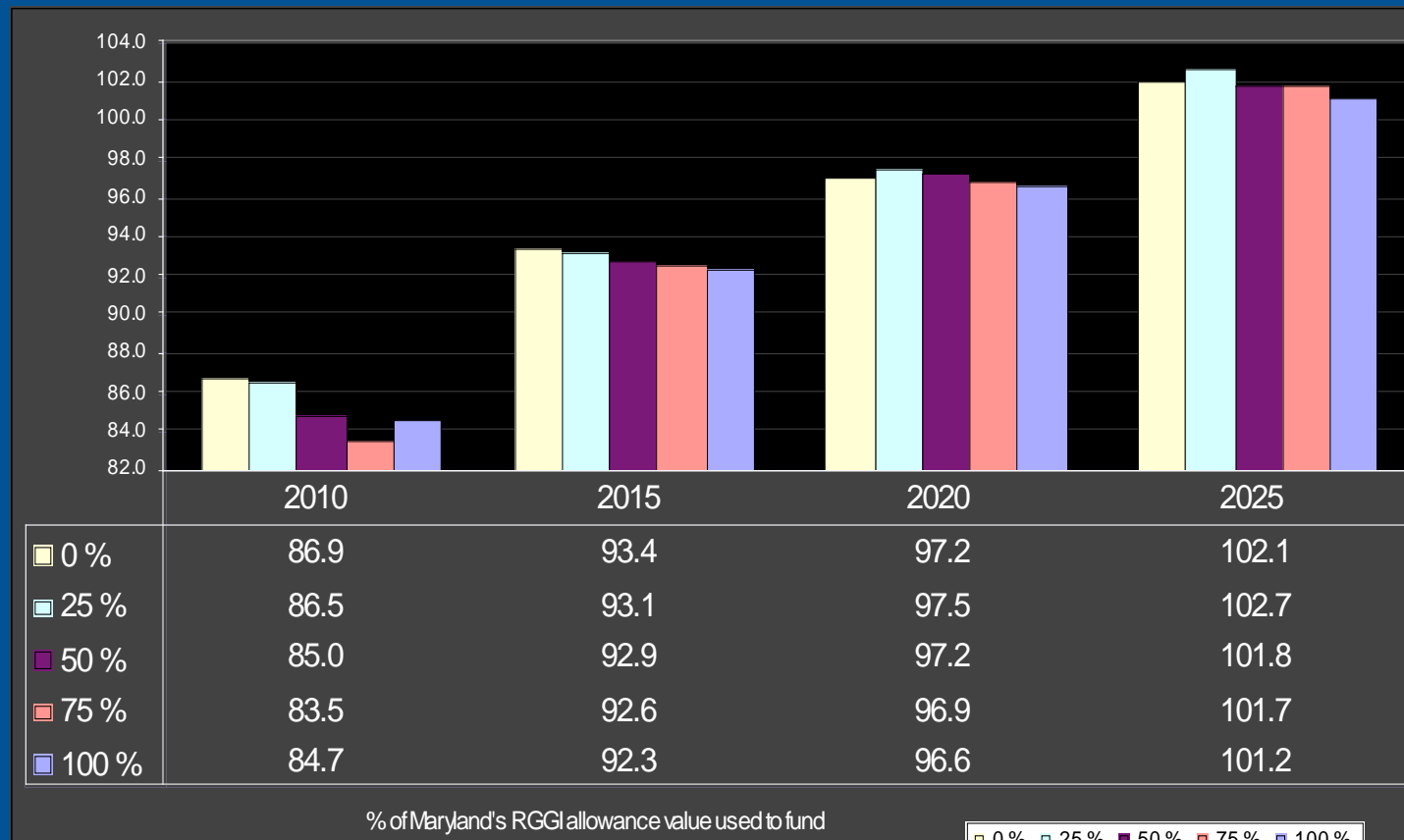


Model Results

- MD electricity prices
- MD generation mix & capacity
- RGGI allowance prices
- MD economic surplus

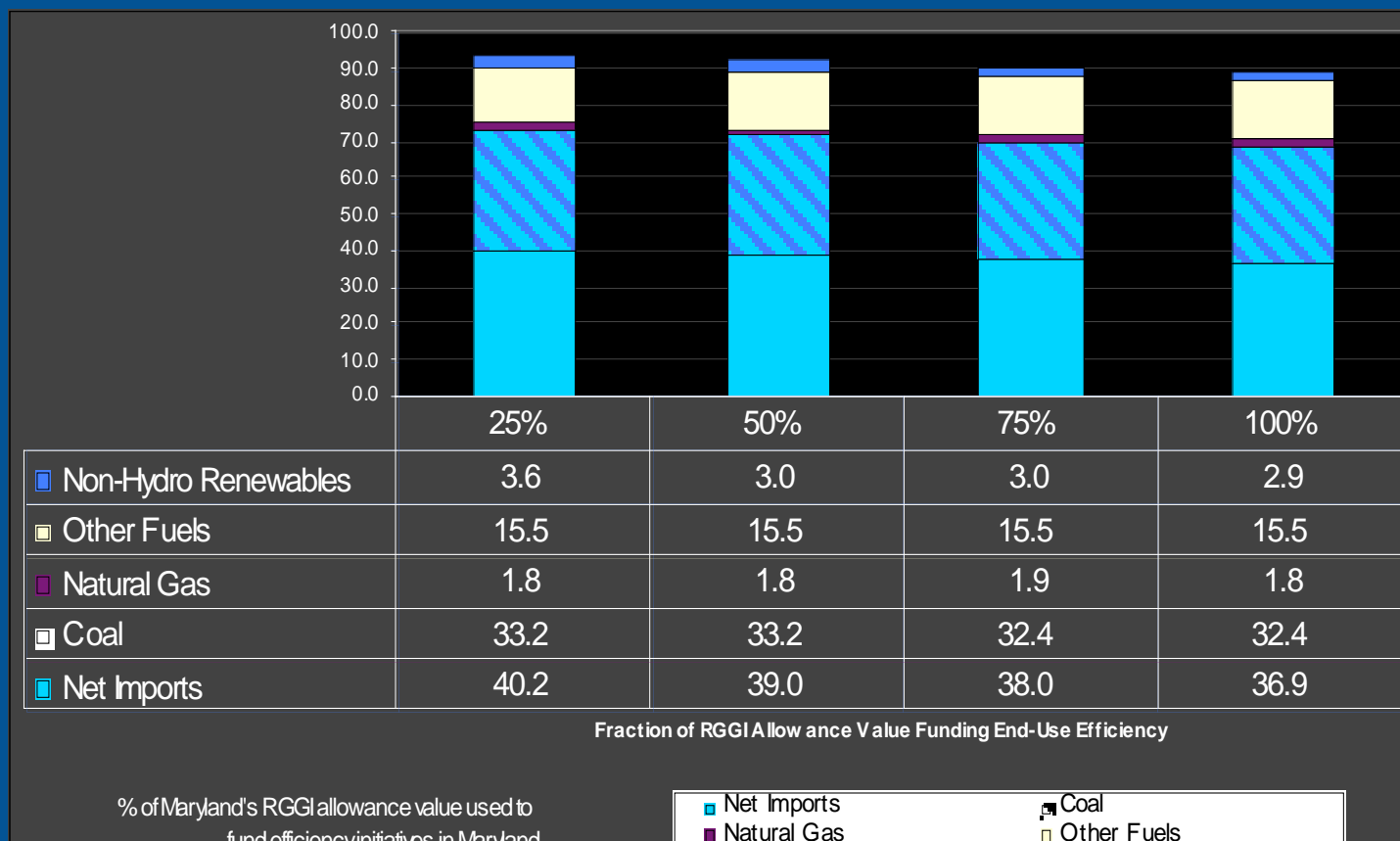
Maryland Electricity Price

[\$/MWh]



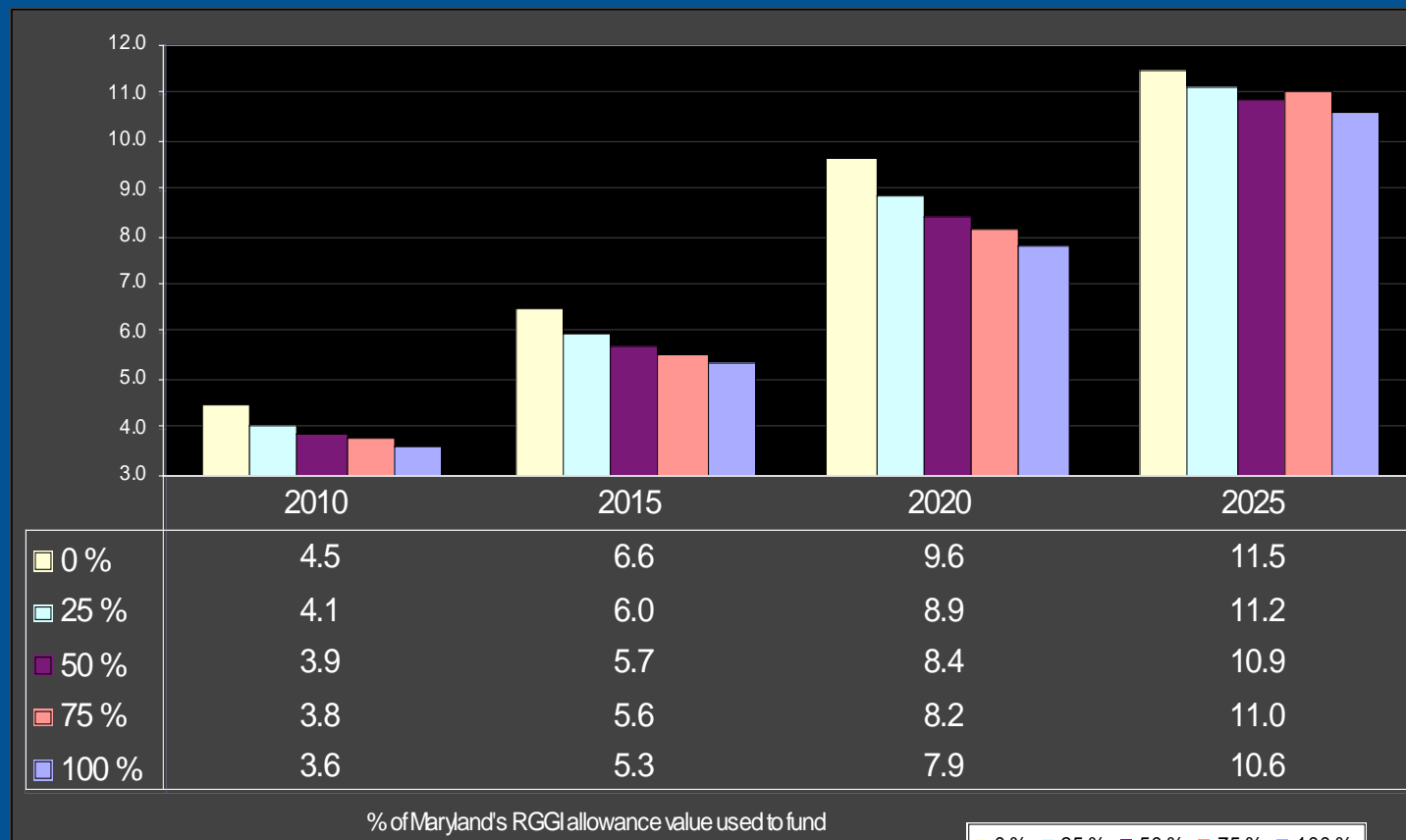
Maryland Generation Fuel Mix in 2025

[BkWh]



RGGI Allowance Price

[\$/MWh]



Economic Surplus in Maryland

- Auction transfers allowance value to state from firms
- Energy efficiency lowers electricity prices
 - increased consumer surplus
 - decreased producer surplus
- Gains to consumers exceed losses to producers

relative to 25% auction (million \$)	2010			2015			2020			2025		
	50%	75%	100%	50%	75%	100%	50%	75%	100%	50%	75%	100%
Consumer Surplus	186	356	325	130	250	348	170	320	450	280	470	630
Producer Surplus	-126	-237	-192	-24	-104	-172	-77	-129	-247	-164	-267	-355
Government Surplus	-5	-5	6	-1	-5	10	0	-2	10	-2	-4	8
Total Surplus	64	123	127	107	141	166	95	195	189	120	200	270

Summary

- Auction vs. Free Allocation
 - No market effects
 - Asset transfer between state & firms
 - Auction raises funds for energy efficiency
- Energy Efficiency Initiatives
 - Lower MD electricity prices & RGGI allowance prices
 - Little change in MD capacity & generation
 - Gains to consumers exceed losses to producers

Thank you!